

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Klaus Fröhlich
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Title: Device for Connecting Ends of Bars
Examiner: Joshua T. Kennedy
Art Unit: 3679

Commissioner for Patents

Alexandria, VA 22313-1450

ARGUMENTS ACCOMPANYING
PRE-APPEAL BRIEF REQUEST FOR REVIEW

Claims 1-5, 7-9 are rejected under 35 USC 103(a) as being unpatentable over *Holdsworth* (US 5,909,980) in view of *Michelson* (US 6,139,550).

Holdsworth discloses a tubular coupler for reinforcing bars that comprises an elongate tubular metal body 112 with converging inner wedge surfaces 125. The tubular body 112 is provided with spaced threaded holes; screws 142 are threaded into the holes for securing the reinforcing bars. The threaded holes are arranged in a single row. The securing action of the coupler 112 is shown in Fig. 12. There is a three-point fixation of the bars in the coupler 112 as a result of the tightened screw 142 and the oppositely arranged projecting surfaces 125. *Holdsworth* does not suggest that more than one row could be used since *Holdsworth* discloses an interaction of the clamping force applied by the screws 142 with opposed wedge-shaped projections 125 providing a seat for the bar. It does not make sense to use a second row of clamping screws in such an arrangement because a safe three-point clamping action is provided that is uniformly distributed about the circumference of the bar.

In comparison to *Holdsworth*, the present invention provides an innovative approach to the clamping of bar ends in a sleeve: instead of providing a complex and difficult to

manufacture interior of the sleeve (in the form of a “clover leaf”), the present invention employs a simple round interior and employs two rows of screws on the same side of the sleeve (pipe section) so that the two rows provide adjustable abutments relative to the opposite inner wall of the sleeve that provides the third fixation point.

Michelson is applied by the examiner to show that it is known in the art to employ staggered rows for a secure engagement of a cylindrical object per se. In examiner's opinion (see page 7 of the final action) it is irrelevant that the reference is classified in U.S. Cl. **606 (surgery)** while the instant application is classified in 403 - concrete construction because *Michelson* deals with an apparatus and a solution for providing a diverse secure connection.

The *Michelson* reference discloses a skeletal plating system while the present invention relates to reinforcement bars in concrete construction. *Michelson* deals with the attachment of a **plate** to bone material whereas the invention is concerned with connecting **two bar ends by means of a sleeve** into which the two bar ends are inserted. *Michelson* secures a plate to one side of a cylindrical body. The screws that are used for attachment penetrate deep into the bone material in order to attach the plate to the bone. The action of the screws pulls the plate against the bone material; the crossed arrangement of the screws “provides an extremely stable engagement of the plate 960 to the bone as they are very close together and diagonally crossed within the same bone thus trapping an area of bone between them” (see col. 27, lines 6-10). The plate is tightly forced against the bone and the connection is improved by bone material being trapped between two angled screws.

The examiner argues that, even though the *Michelson* reference is classified in a different field, it still deals with an apparatus and a solution for providing a diverse secure connection. The disclosed secure connection is achieved by attaching a plate by screws to bone in that the screws penetrate into the bone material and pull plate and bone tightly against one another. The present invention and *Holdsworth* deal with **clamping** rods in a sleeve - the sleeve is not to be tightly pulled against the rod but instead the rod is to be clamped uniformly at several locations within the sleeve. In contrast to *Michelson*, the screws of the present invention and of *Holdsworth* are used to **push** the rod material away from the sleeve and not to pull the rod material tightly against the sleeve. The bar ends are

only to be clamped within the sleeve by the clamping elements that apply a force onto the exterior of the rebar ends and push them against opposed abutments so that the rod is subjected to a clamping action at several locations in the circumferential direction.

The *Michelson* reference is from a different field and deals with a different problem, i.e. tightly and securely **pulling** a plate and cylindrical object against one another in order to provide a stable connection between the two parts. *Michelson* teaches that in connection with securing a plate to a cylindrical object a tighter connection between the two elements is realized when two rows of staggered screws are used because the material of the bone is trapped between the screws. This is a different concept from the concept of pushing two elements apart from one another in order to provide a clamping action at abutments located opposite to the screws.

Holdsworth enables secure clamping by providing a safe three-point fixation of the bar end within a sleeve with screws that push the bar ends against two oppositely arranged abutments. *Holdsworth* provides a simple solution because the three-point fixation requires only one screw to be tightened for each clamping point; the bar will center itself between the two abutment surfaces 125 and the screw tip. The tight attachment of *Michelson* has nothing in common with the **clamping concept** of *Holdsworth*. A person skilled in the art has no reason to look at *Michelson* because a penetration of the screws into the rebar ends is not desirable and because the arrangement of two staggered rows of screws is taught as a means for pulling two parts tightly toward one another and for improving the tight connection by trapping material between the screws. This is not applicable in connection with *Holdsworth* as *Holdsworth* only applies external clamping forces on the circumference of the bar ends. *Holdsworth* and *Michelson* apply to different fastening principles.

The *Michelson* reference is non-analogous art because it is from a different field and because it deals with a different problem. Moreover, as set forth above, there is no motivation to combine *Holdsworth* and *Michelson*. *Holdsworth* does not require a **tighter connection** between the sleeve and the rod ends - the row of screws in *Holdsworth* is used to **push apart** the rod ends and the sleeve.

Examiner applies the *Michelson* reference in hindsight in view of the solution

presented by the present invention - the *Holdsworth* solution with three-point fixation action does not require two rows of screws for clamping the bar - in particular it does not require to rows of screws that **pull** the sleeve against the rod material instead of pushing the sleeve toward oppositely positioned abutments.

The examiner argues (page 8 of the office action, lines 3 and 4) that the present invention does not provide anything in the claim language that requires the connection to be realized strictly by external clamping forces. Applicant respectfully disagrees: claim language of claim 1 defines **clamping** elements; claim 2 defines “clamping elements have ends for **applying a clamping force** on bar ends” and “the ends of the clamping elements **apply the clamping force** in different directions”.

Claim 1 and in particular claim 2 are therefore not obvious in view of the cited references.

Respectfully submitted on August 9, 2006,

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